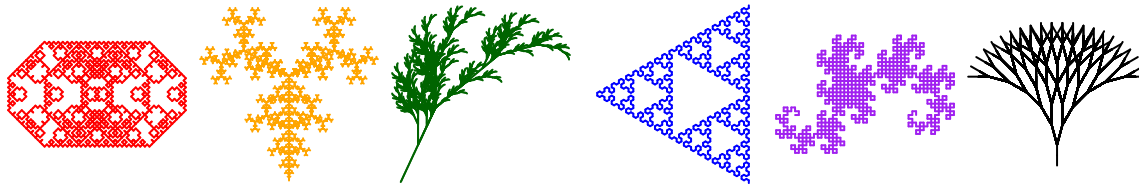


Lindenmayer Systems and Turtle Graphics



A Lindenmayer system (or L-system) is a set of rewrite rules. When these rules are repeatedly applied to a starting string (“word”), we can get complex results from simple rules. For example:

Start:

x

Rules:

A = A-

x = Ax

- = -

(The “-” character is a constant. We usually don’t bother listing constants.)

The start string and first 4 recursions:

0. x
1. Ax
2. A-Ax
3. A--A-Ax
4. A---A--A-Ax

Practice

Start:

A

Rules:

A = -B

B = -AB

The start string and first 4 recursions:

0. A
1. -B
2. --AB
3. ---B-AB
4. ----AB--B-AB

When L-system strings' characters correspond to drawing commands, we can get fractal-like patterns.

Use the following table of drawing commands:

F = Move forward one step while drawing line

X = Move forward one step without drawing line

+ = Turn right 90°

- = Turn left 90°

[= Save current position (x, y, and direction) to top of list

] = Teleport to top-of-list position (without drawing); erase top-of-list position

Starting at (0,0) pointing up, draw the pattern described by the commands in the string below:

FF [+F-F] [-F+F] xFFF [+F-F] [-F+F] xF [+FF [+F-F] [-F+F] xF

-FF [+F-F] [-F+F] xF] [-FF [+F-F] [-F+F] xF+FF [+F-F] [-F+F

] xF] xFF [+F-F] [-F+F] xF

